Ministerie van Verkeer en Waterstaat

HSL-Zuid

Master the project to it’s goals

Subjects in this presentation

Context information

Preparation and tenderphase

D&C-contracts

DBFM-contract

October 11th, 2006

Context information

Result

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- 100 kms new track
- 170 civil construction works
- Stations of call:
  Amsterdam, Rotterdam, Schiphol, Breda and The Hague
- Parallel contruction of HSL-Zuid with A4 and A16 motorways and widening and realignment
- 25-year Maintenance Contract
- 15-year Transportation Concession
- Total expenditure civil and railway constructions: approximately € 7.000 mln.

Project Progress

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- 1973: Feasibility study
- 1992: Development ‘New HSL-Paper’
- 1996: Cabinet decision to construct HSL-Zuid; ratification by Parliament.
- 1998: Final Route Decision
- 1999: Tendering
- 2000: Construction kick off
- 2006: Completion of stretch Rotterdam – Belgium
- 2007: Completion of stretch Amsterdam – Rotterdam
- 2007: Kick off commercial transportation Amsterdam – Paris

Actual situation

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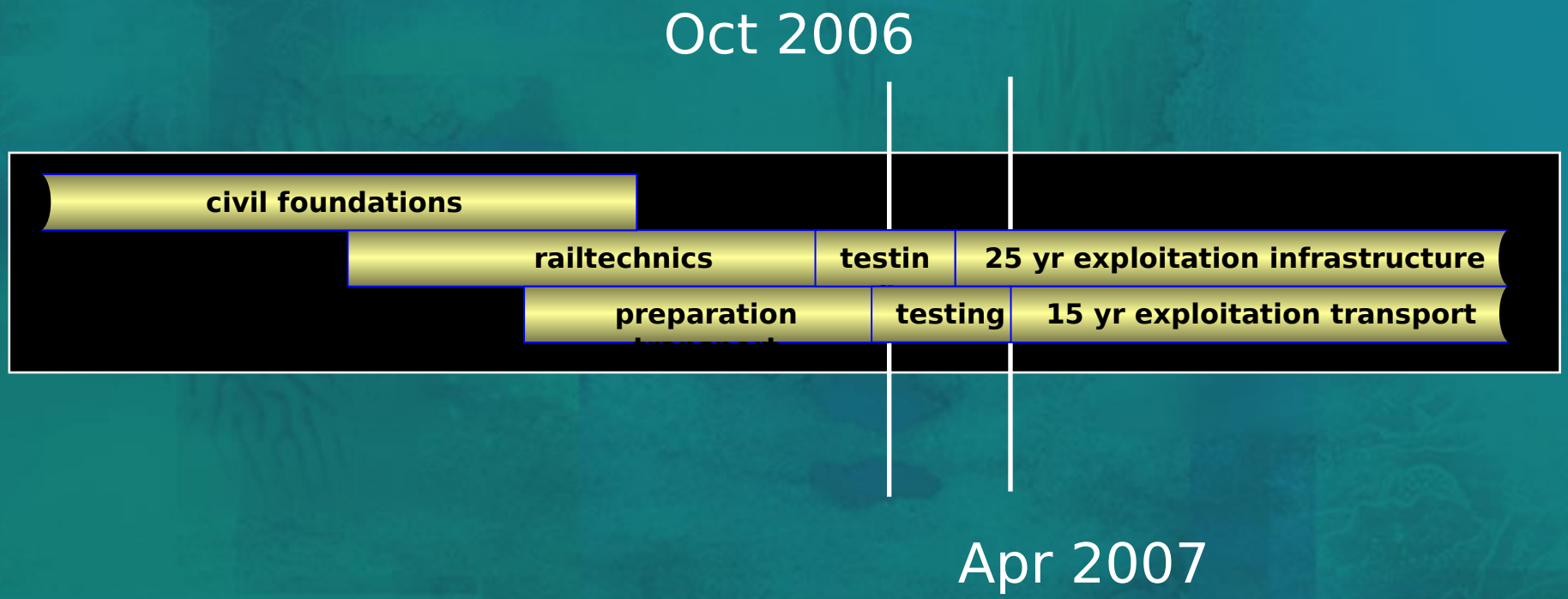

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Preparation and tenderphase

Preparation of the project

- A High Speed Railway through densely populated area
- Much influence of the ‘project neighbourhood’:
  - Communities, provinces, neighbours (civilians, companies), polder-boards, interest groups etc.
- Consequence: lot of participation. Complex decision-processes. Dutch style: harmony / consensus
- 1997: Planologische Kern Beslissing (PKB): broad political fixation of the route
- 1998: Tracébesluit (TB): More detailed political fixation.
  - Directives, functional requirements

Preparation to tender

- TB: mainly functional requirements
- Rough design of the line; work out in technical solutions
- Design capacity: project organisation of about 900 FTE.
- Interim result: far advanced design of the civil work
- But ….. 1998 / 1999: change of policy:
  - Use the innovative force of the market (cheaper, better)
  - Back to functional requirements
  - Limit the role of the government
  - Split up the projects in manageble parts
  -

Split up the project

passenger transport: 1 concession-agreement

railtechnical installations: 1 DBFM contract

civil-technical foundation: 6 D&C contracts

Breda

Rotterdam

Hoofddorp

connections with existing railinfrastructure: 1 D&C contract

Logical sequence of tendering?

Logical: Lead down the functional requirements from the transporter to the civil contractors:

1. Passenger-transporting company
2. Rail-technical contractor
3. Civil-technical contractors

- Instead, we contracted in the opposite direction. First civil, then rail, then passenger transport
- Necessary to get the project ‘on the run’
- Consequence: many interface risks

Tendering contracts on different moments

- Civil D&C contracts: july 2000
- 1st step civil contractors: make a design!!
- Big question for tendering the rail technical contractor:

  “What will be the exact result of the civil foundations on which the railtechnical equipment (rails, overhead lines, safety equipment etc) can be build?”
- Frozen design civil foundations: basis for tendering the railway contractor
- But: also basis for many interface disconnects later in the project

Risks:

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- Interface risks between the contracts
- Conditioning risks: state remained responsible for ‘conditions’ concerning: allowances/licences, cables and pipes in the ground, compensation of nature, geological and environmental information, archeology etc.
- Achitectual risks (general requirements)
- Contractual risks
- Overall planning risks
- Stakeholder risks

⇨ **Risk management crucial ‘tool’ in HSL-project management**

Project-baselines HSL-Zuid

Realize:

- An integral working passenger transport system HSL-Zuid with the required quality level, **SCOPE**
- Operational on the moment agreed **TIME**
- Within the available financial budget **MONEY**

Baseline-control proces

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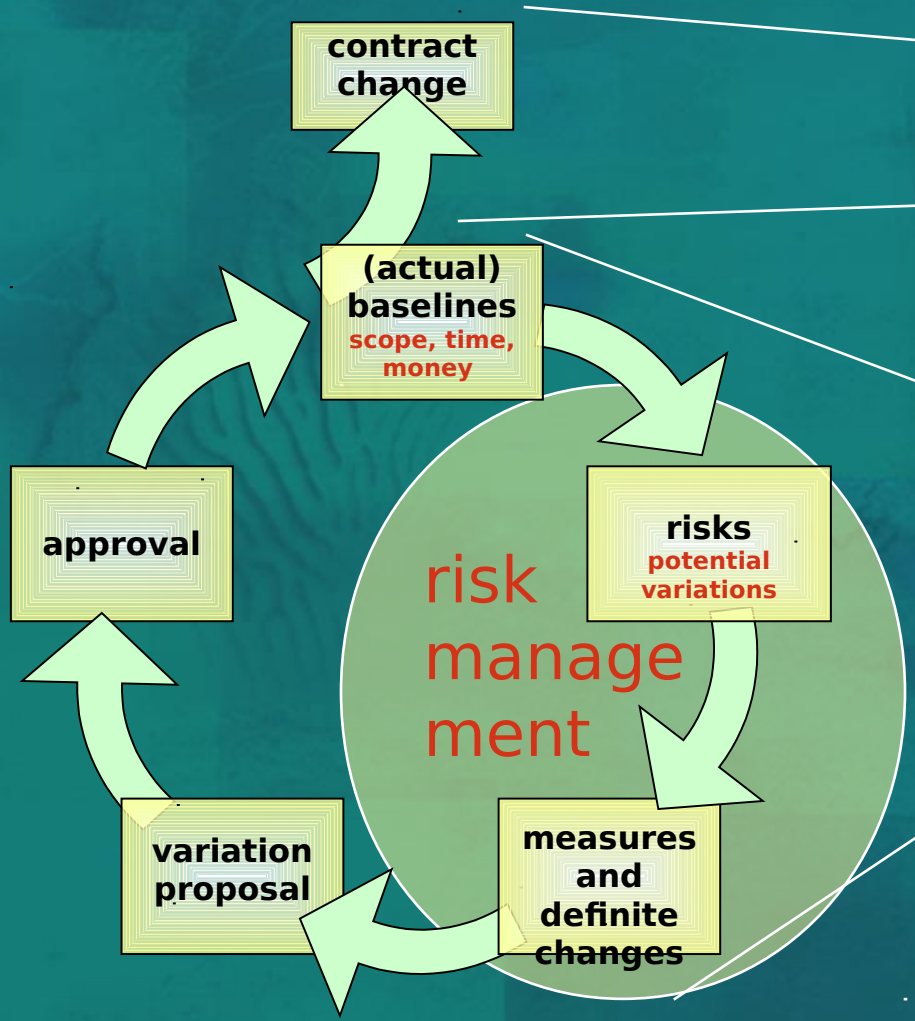

external proces

internal proces

Risk management: avoid surprises

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project baselines

too expensive

too late

result

moderate quality

lack of functionality

Risk management

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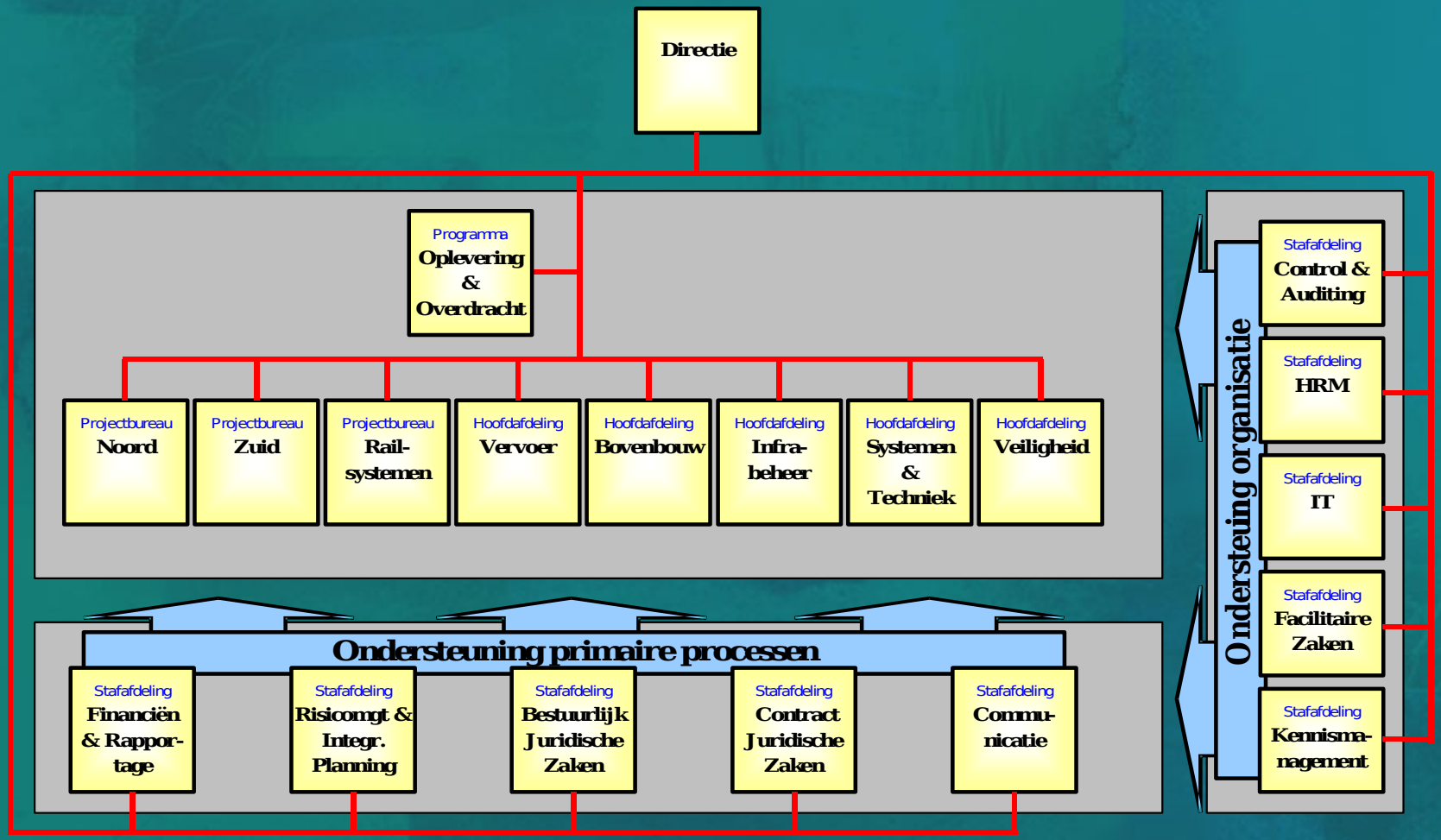
- Risk: possible change in the baselines. To avoid ‘surprises’ and unwanted changes (or realise wanted changes)
- **“Identify serious risks as early as possible and take measures to reduce or erase negative consequences (or realise positive consequences) for the project”**
- A risk can be identified by the principal, but can also be announced by a contract-party
- Risks are not only technical and financial, but can also be based on: juridical aspects, planning, internal / external interfaces, organisational aspects, quality systems, laws, political etc.

Project organisatie in 2004 / 2005



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D&C Civil technical contracts

Civil D&C Contracts (1)

- Government: in 1998/1999 back from technical design to functional requirements
- Tendering in an overstressed market for civil work (HSL + BR)
- Invitation to tender in 1999. Design & Construct: “Offer an innovative design based on functional requirements.”
- The principal’s technical design (until so far) was made available to the contracters for ‘referential purposes’
- Much time pressure
- Consequence: presented designs had very little

Civil D&C Contracts (2)

- Many project risks were included in te contractors scope
- Consequence: financial extremely high offers in relation to the project budget
- The planned 3 months of negotiations grew out to 9 months
- Arbitration, mediation and political pressure to reach agreements and contracts
- Ultimately the Dutch State took back many risks
- In the contracts ‘options and optimalisations’ were defined
- In july 2000 five[1)] D&C contracts were signed

Bored Tunnel under the ‘Green Hart’

- One remarkable exception on the civil contracts was te Bored Tunnel: “example of *working* Design & Construct”

- ‘Technical’ expectation bij the Dutch State: two bored tubes
- Contracter (Bouygues, France) offered one tube with a tunnel-deviding wall
- More profitable for the contractor
- Cheaper for the State

Managing the Civil contracts

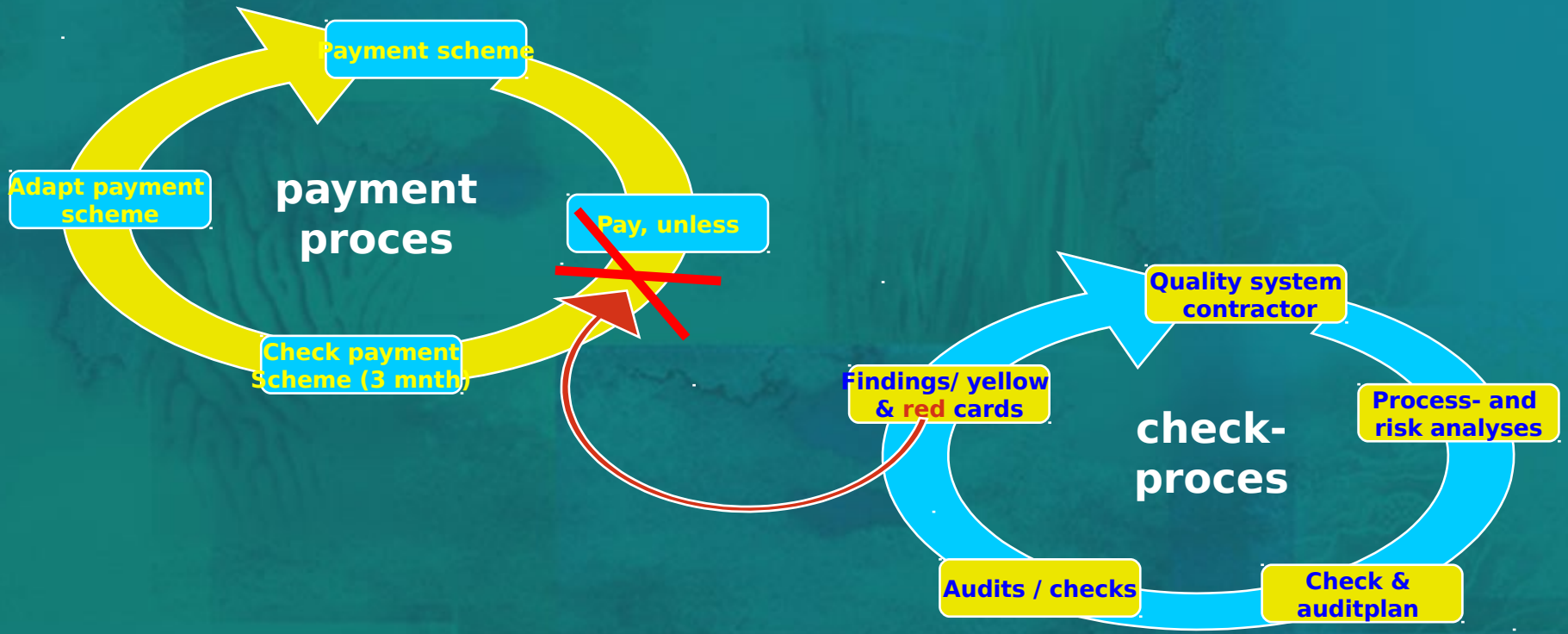
Design & Construct:

- Relatively new concept for the Dutch State and Contractors
- Difference with tradional contracts:
  - Contractor makes the design
    (use of the creativity of the market)
  - Based on functional requirements

Contractmanagement:

- Application of EKB (Externe Kwaliteits Borging / External Quality Assurance)
  - Contractor is integral responsible for quality
  - Principal focusses on the contractor's quality

D&C-contracts: management with EKB



Basical principles
EKB civil contracts (1)

The contactor

➔ is responsible for the total quality of the contract

➔ uses an adequate quality system (ISO-approved and accepted by the principal). ‘Fit’ to the specific contract and circumstances

➔ works in accordance with that quality system

➔ demonstrates the required quality during the design and building processes

➔ and consequently realises the scope that was ordered

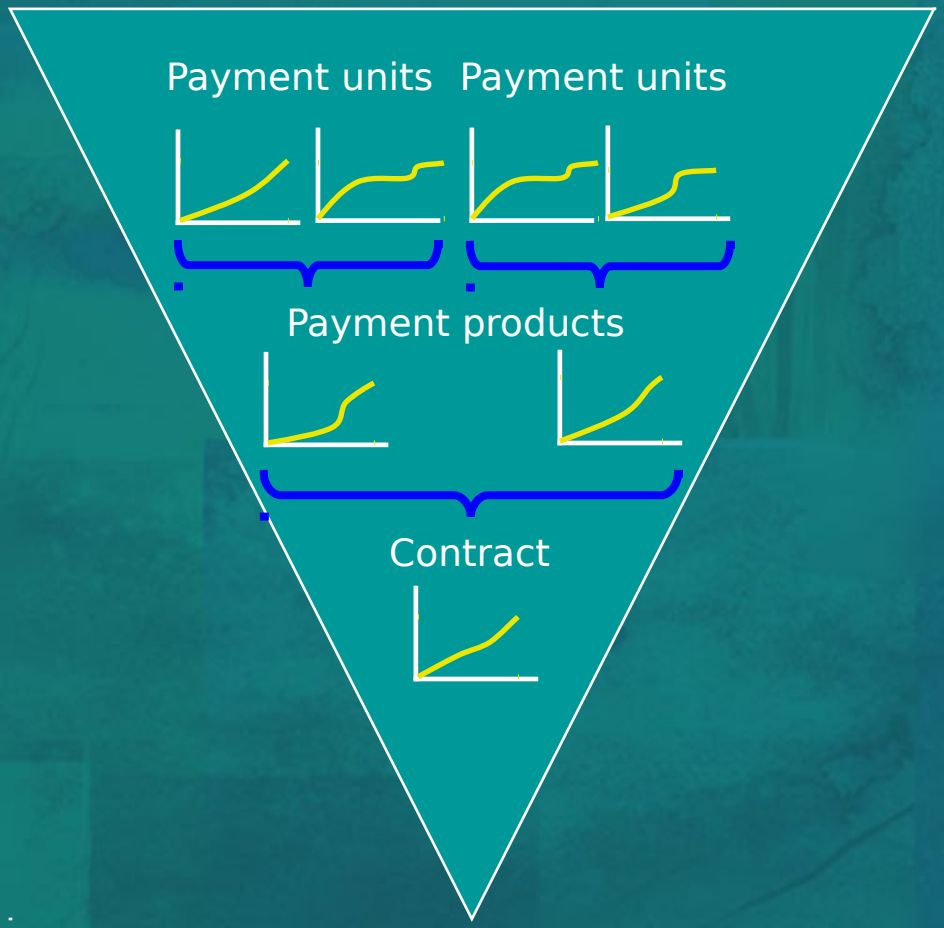
- Basic assumption: “A good system and a good proces lead to a good product”

Basical principles
EKB civil contracts (2)

The principal:

- ➔ reviews / accepts the contractor's quality system
- ➔ pays the contractor on planned progress
- ➔ uses (risk-based) audits and checks
- ➔ focuses on quality systemen, working processes, but also on products as result of the building process from the contractor
- ➔ sanctions the contractor for relevant deviations by stopping the payments for a payment-unit, payment product, or the whole contract. Two Yellow cards = a Red card = Payment stop (for a specific part of the scope)

Payment structure



Essential condition

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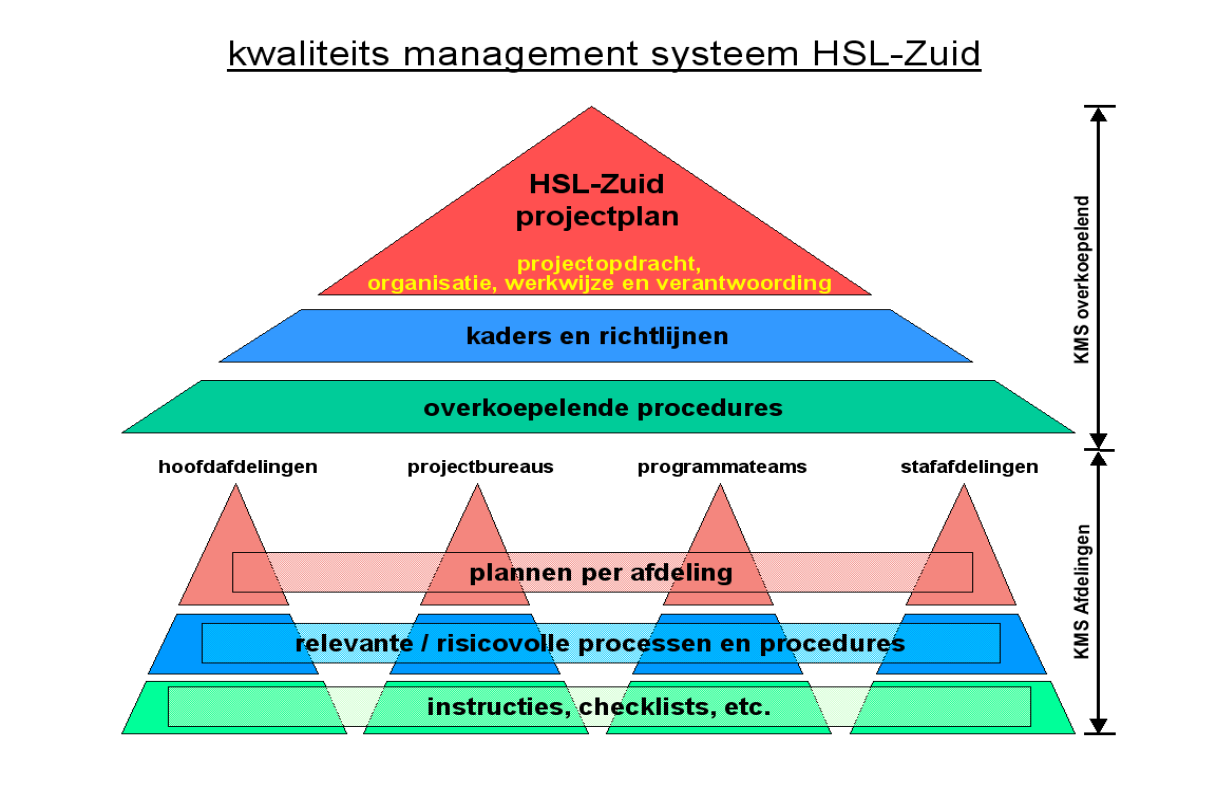
- The principal needs an adequate quality system to manage the contract appropriately



External Quality Assurance in relation to Internal Quality Assurance

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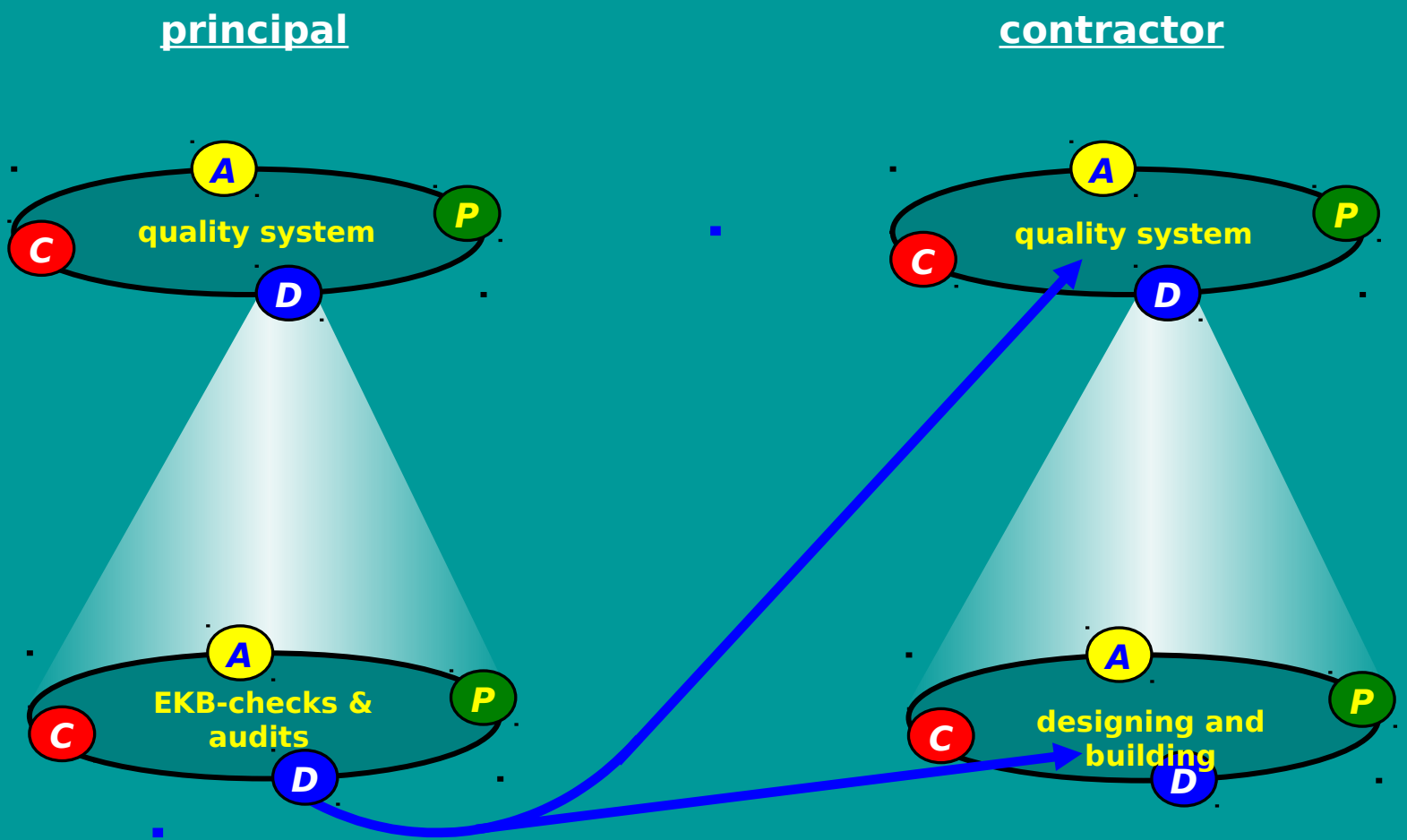

Internal Quality Assurance

HSL-Zuid as reliable principal works in a reliable way

- Reliable for the contractors, but also for the principal's principal: the tax payer
- An internal quality system with clear and understandable procedures
- A 'flexible' system: changing circumstances in the project require willingness and possibilities to adapt the procedures
- Internal and external auditing are necessary to assure that the system is OK, that the work is done in accordance with the system and that necesary improvements are implemented
- The auditing-program is based on an analysis of the most relevant and risk-sensitive processes

Preventive and corrective measures

Preventive measures:

Try to reduce or eliminate the thread in advance by:

- reducing te chance that the risk will appear
- reducing the consequences in advance

Corrective measures:

After a risk has become a fact:

- measures to correct the damage
- temporary provisions
- measures to realise the project in an alternative way

Lessons learned in the D&C contracts (1)

- Invest in the relation with the contractor. Reach agreement about the interpretation of the contract, the responsibilities and roles of both parties in an early stage.

- An adequate quality system is essential for both parties.

- (Technical) supervisors with ‘traditional experience’ need extra education in an EKB-oriented contract. ‘Process-thinking’ is essential. It is a special skill that ‘has to be learned’

Lessons learned in the D&C contracts (2)

- The EKB-method has proven to be succesfull. But only system and process checks are not sufficient. Product checks are necessary to be fully convinced.

- For the contractors these contracts had many awkward ‘new’ aspects. Full responsibility for the design and the quality, another way of contractmanagement, influence of the project neigbourhood etc.

Lessons learned in the D&C contracts (3)

- The risks taken back by the Dutch State in the tenderphase have ultimately become ‘reality’ for the greater part. Expected ‘savings’ in the tender phase turned out to be fals expectations.

- Risk management has proven to be a powerfull tool to manage the contracts.

- The (dynamic) interfaces with the Railway-contract have lead to many adjustments with considerable financial consequences.

DBFM Railtechnical contract